

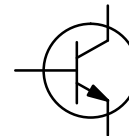
BUL43B

Product Preview

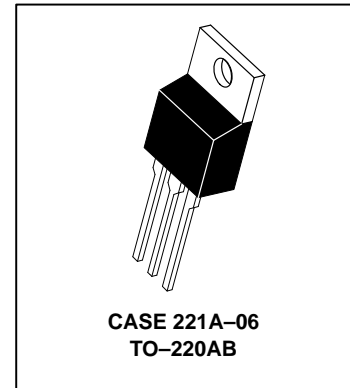
**SWITCHMODE NPN Silicon
Planar Power Transistor**

The BUL43B has an application specific state-of-the-art die designed for use in 220 V line operated Switchmode Power supplies and electronic ballast ("light ballast"). The main advantages brought by this new transistor are:

- Improved Efficiency Due to Low Base Drive Requirements:
 - High and Flat DC Current Gain h_{FE}
 - Fast and Tightened Switching Distributions
 - No Coil Required in Base Circuit for Fast Turn-Off (no current tail)



**POWER TRANSISTORS
2 AMPERES
700 VOLTS
40 WATTS**



MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|------------|---------------------|
| Collector-Emitter Sustaining Voltage | V_{CEO} | 350 | Vdc |
| Collector-Base Breakdown Voltage | V_{CBO} | 650 | Vdc |
| Collector-Emitter Breakdown Voltage | V_{CES} | 650 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 9 | Vdc |
| Collector Current — Continuous | I_C | 2 | Adc |
| — Peak (1) | I_{CM} | 4 | |
| Base Current — Continuous | I_B | 1 | Adc |
| — Peak (1) | I_{BM} | 2 | |
| *Total Device Dissipation @ $T_C = 25^\circ\text{C}$ | P_D | 40 | Watt |
| *Derate above 25°C | | 0.32 | W/ $^\circ\text{C}$ |
| Operating and Storage Temperature | T_J, T_{stg} | -65 to 150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| | | | |
|--|-----------------|-------|--------------------|
| Thermal Resistance | | | $^\circ\text{C/W}$ |
| — Junction to Case | $R_{\theta JC}$ | 3.125 | |
| — Junction to Ambient | $R_{\theta JA}$ | 62.5 | |
| Maximum Lead Temperature for Soldering Purposes: 1/8" from case for 5 seconds | T_L | 260 | $^\circ\text{C}$ |

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle.

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BUL43B**ELECTRICAL CHARACTERISTICS** ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------------|-----|-----|-----------|---|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Sustaining Voltage ($I_C = 100\text{ mA}$, $L = 25\text{ mH}$) | $V_{CEO(sus)}$ | 350 | | | Vdc |
| Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CEO}$, $I_B = 0$) | I_{CEO} | | | 100 | μAdc |
| Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CES}$, $V_{EB} = 0$) | I_{CES} | | | 10 200 | μAdc |
| | | | | | @ $T_C = 25^\circ\text{C}$ @ $T_C = 125^\circ\text{C}$ |
| Emitter–Cutoff Current ($V_{EB} = 9\text{ Vdc}$, $I_C = 0$) | I_{EBO} | | | 100 | μAdc |

ON CHARACTERISTICS

| | | | | | |
|---|---------------|----------------------------|---|------|-----|
| Base–Emitter Saturation Voltage ($I_C = 2\text{ Adc}$, $I_B = 0.5\text{ Adc}$) | $V_{BE(sat)}$ | | | 1.25 | Vdc |
| Collector–Emitter Saturation Voltage ($I_C = 2\text{ Adc}$, $I_B = 0.5\text{ Adc}$) | $V_{CE(sat)}$ | @ $T_C = 25^\circ\text{C}$ | | 1 | Vdc |
| DC Current Gain ($I_C = 1\text{ Adc}$, $V_{CE} = 2\text{ Vdc}$) | h_{FE} | @ $T_C = 25^\circ\text{C}$ | 8 | | — |
| ($I_C = 2\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$) | | @ $T_C = 25^\circ\text{C}$ | 6 | | — |

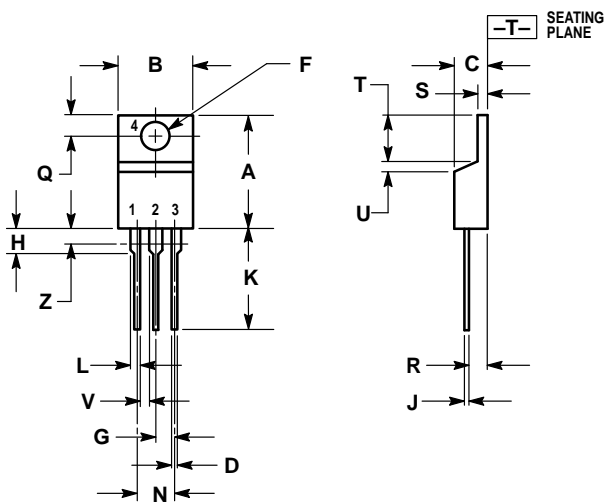
DYNAMIC CHARACTERISTICS

| | | | | | |
|--|----------|--|-----|--|-----|
| Current Gain Bandwidth ($I_C = 0.5\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1\text{ MHz}$) | f_T | | 13 | | MHz |
| Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1\text{ MHz}$) | C_{ob} | | 40 | | pF |
| Input Capacitance ($V_{EB} = 8\text{ V}$) | C_{ib} | | 400 | | pF |

SWITCHING CHARACTERISTICS: Resistive Load (D.C. $\leq 10\%$, Pulse Width = 20 μs)

| | | | | | | | |
|---------------|--|----------------------------|-----------|-----|--|-----|---------------|
| Turn–off Time | $I_C = 1.2\text{ Adc}$, $I_{B1} = 0.4\text{ Adc}$ $I_{B2} = 0.1\text{ Adc}$ $V_{CC} = 300\text{ Vdc}$ | @ $T_C = 25^\circ\text{C}$ | t_{off} | 4.7 | | 5.8 | μs |
| Fall Time | $I_C = 2.5\text{ Adc}$, $I_{B1} = 0.5\text{ Adc}$ $I_{B2} = 0.5\text{ Adc}$ $V_{CC} = 150\text{ Vdc}$ | @ $T_C = 25^\circ\text{C}$ | t_f | | | 800 | ns |

PACKAGE DIMENSIONS




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | — | 1.15 | — |
| Z | — | 0.080 | — | 2.04 |

- STYLE 1:
- PIN 1. BASE
 2. COLLECTOR
 3. EMITTER
 4. COLLECTOR

CASE 221A-06
TO-220AB
ISSUE Y

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